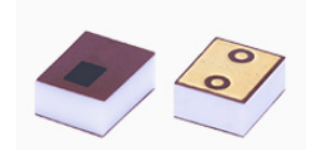




THE BIG DEAL

- Ultra-Wideband DC to 30 GHz Performance
- Compact 1008 Package
- Low Insertion Loss, Typ. <1.5 dB Through 30 GHz
- Ideal LTCC Thru-Line Solution for Placeholder and Signal Routing Applications



Generic photo used for illustration purposes only

FUNCTIONAL DIAGRAM



APPLICATIONS

- RF Signal Routing and Interconnection
- Placeholder Element for NL1008C-10 Footprint Components
- Broadband Signal Transmission Paths from DC to 30 GHz
- Prototyping and Evaluation of RF Signal Chains

PRODUCT OVERVIEW

The TPHK-33+ is a 50Ω LTCC surface-mount thru-line design to provide low-loss signal transmission from DC to 30 GHz. It serves as an ideal placeholder or routing element in RF signal chains, particularly in designs anticipating filter insertion or frequency-selective components. Fabricated using advanced LTCC technology, the device offers consistent electrical performance, excellent impedance matching and repeatability in high-frequency applications. Its compact 1008 footprint enables dense PCB layouts while minimizing parasitic effects, making it well-suited for modern high-frequency and high-density system designs.

KEY FEATURES

Features	Advantages
Wideband DC to 30 GHz Operation	Supports multi-band and broadband system architectures.
Low Insertion Loss	Minimizes signal degradation across the full frequency range.
Surface Mountable	Suitable for very high-volume automated assembly process.



LTCC SURFACE MOUNT

Thru-Line

TPHK-33+

50Ω DC to 30 GHz

ELECTRICAL SPECIFICATIONS^{1,2} AT +25 °C, $Z_0 = 50\Omega$

Parameter		F#	Frequency (GHz)	Min.	Typ.	Max.	Units
Passband	Insertion Loss	DC-F1	DC-10	-	0.3	0.6	dB
		F1-F2	10-20	-	1.2	1.45	
		F2-F3	20-30	-	1.5	2.1	
	Return Loss	DC-F1	DC-10	10	20	-	dB
		F1-F2	10-20	10	15	-	
		F2-F3	20-30	-	11	-	

1. Tested in Evaluation Board P/N TB-TPHK-33C+ with the connector and feedline effects de-embedded using the 2X Thru IEEE P370 method.

2. Bi-directional, RF1 and RF2 ports can be interchanged, see S-Parameters for performance.

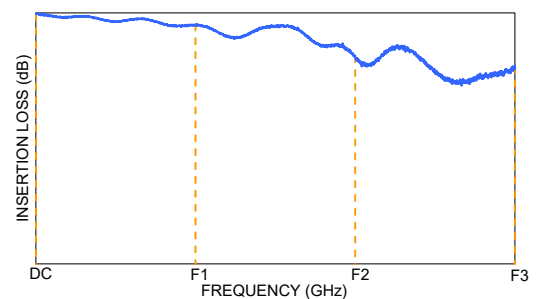
ABSOLUTE MAXIMUM RATINGS³

Parameter	Ratings
Operating Temperature	-55 °C to +125 °C
Storage Temperature	-55 °C to +125 °C
Input Power ⁴	10 W

3. Permanent damage may occur if any of these limits are exceeded.

4. Power rating applies only to signals within the passband. Power rating above +25 °C operating temperature decreases linearly to 6.9 W at +125 °C.

TYPICAL FREQUENCY RESPONSE





LTCC SURFACE MOUNT

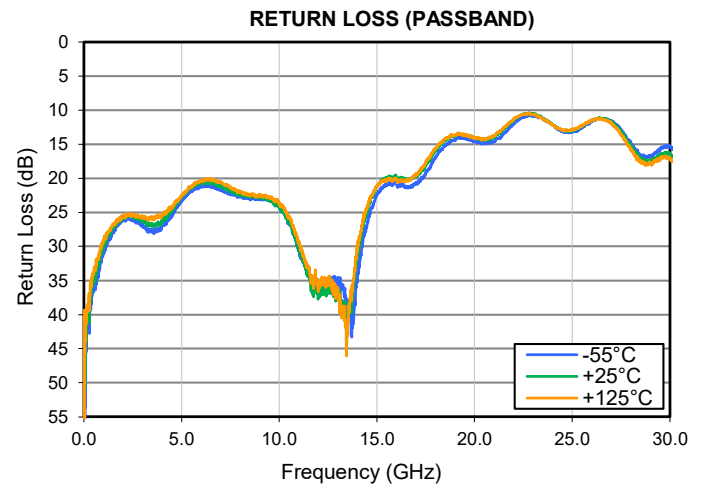
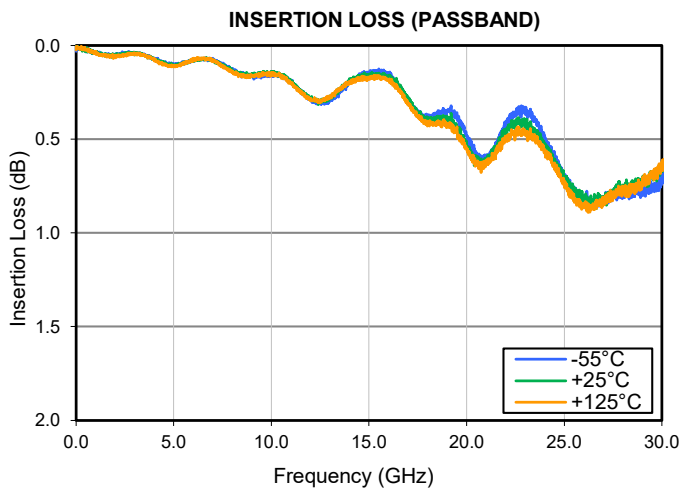
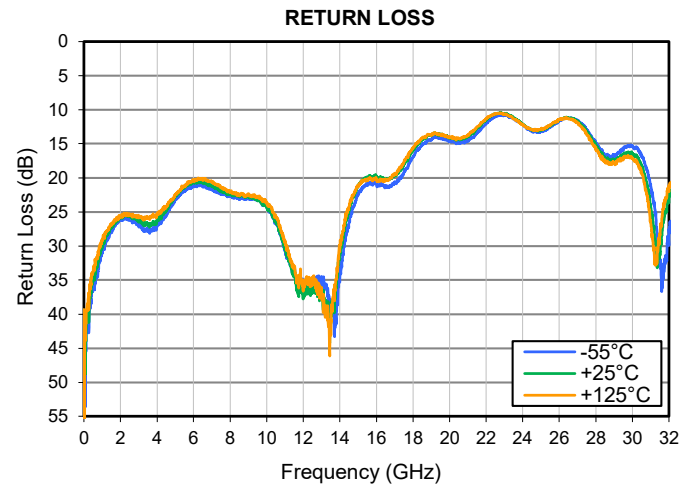
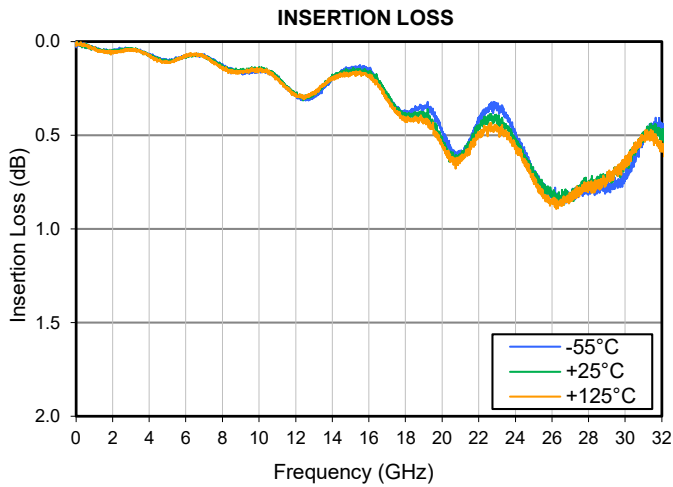
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TPHK-33+

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50 Ω DC to 30 GHz

TYPICAL PERFORMANCE GRAPHS



FUNCTIONAL DIAGRAM

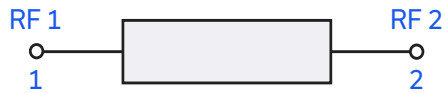
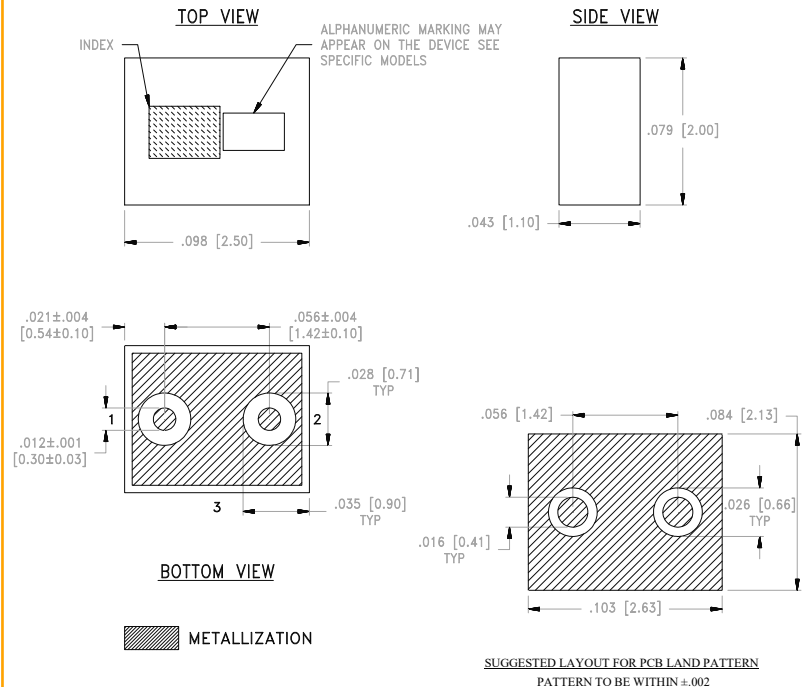


Figure 1. TPHK-33+ Functional Diagram

PAD DESCRIPTION

Function	Pad Number	Description
RF1 ²	1	Connects to RF Input Port
RF2 ²	2	Connects to RF Output Port
GROUND	3	Connects to Ground on PCB, (See drawing PL-798)

CASE STYLE DRAWING



Dimensions are in inches [mm]. Tolerances: 2 Pl.±.01; 3 Pl.±.005

PRODUCT MARKING*: V1

*Marking may contain other features or characters for internal lot control.



SUGGESTED PCB LAYOUT (PL-798)

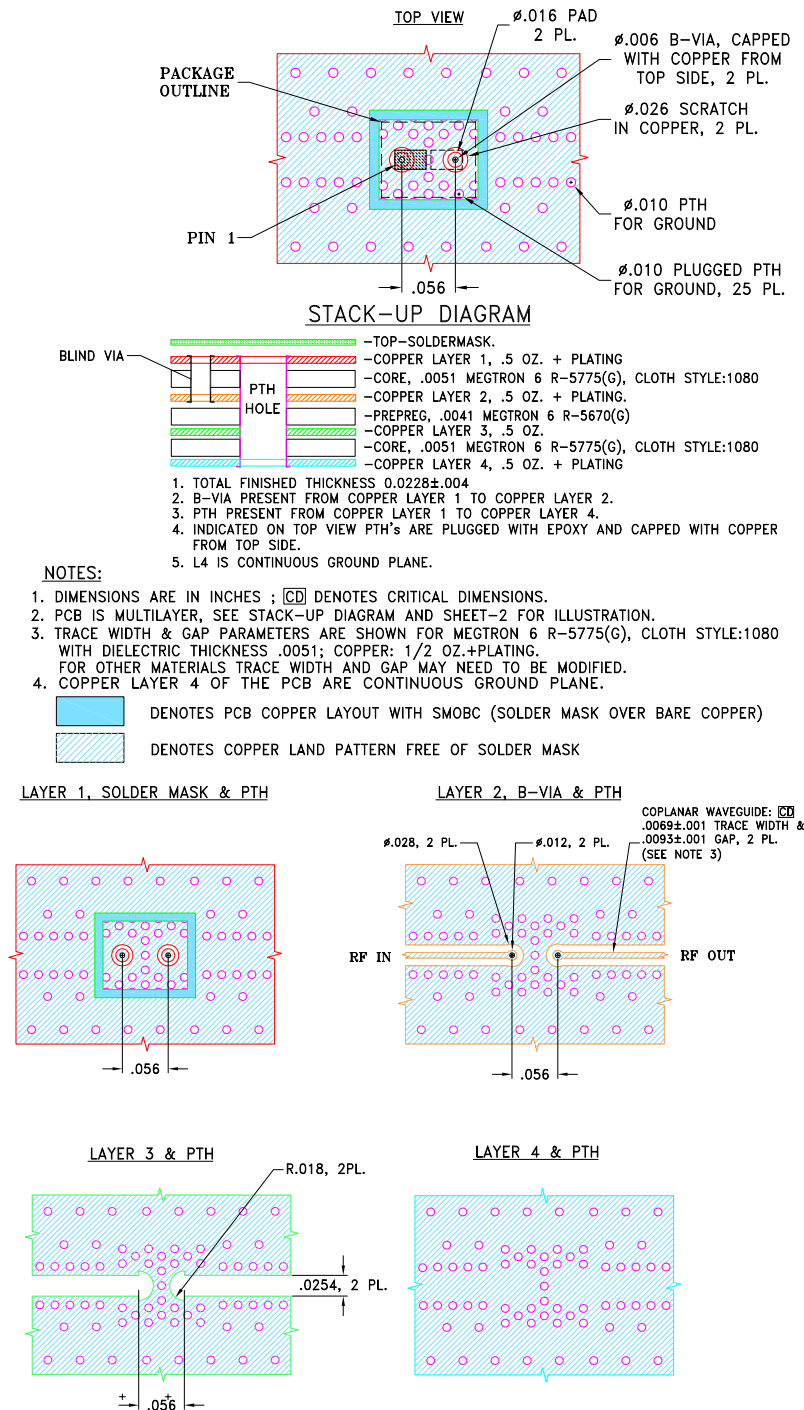


Figure 2. Suggested PCB Layout PL-798



Mini-Circuits

LTCC SURFACE MOUNT

Thru-Line

TPHK-33+

50Ω DC to 30 GHz

ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASHBOARD.

[CLICK HERE](#)

Performance Data & Graphs	Data
	Graphs
	S-Parameter (S2P Files) Data Set (.zip file) De-embedded to device pads
Case Style	NL1008C-10 Lead Finish: Gold over Electroless Nickel
RoHS Status	Compliant
Tape and Reel	F75
Suggested Layout for PCB Design	PL-798
Evaluation Board	TB-TPHK-33C+
	Gerber File
Environmental Rating	ENV06T10

NOTES

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuits' applicable established test performance criteria and measurement instructions.
- The parts covered by this specification document are subject to Mini-Circuits' standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/terms/viewterm.html

